



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,341	09/18/2003	Zhisheng Deng	MAT-8463US	7041
23122	7590	12/09/2005	EXAMINER	
RATNERPRESTIA P O BOX 980 VALLEY FORGE, PA 19482-0980			RENNER, CRAIG A	
			ART UNIT	PAPER NUMBER
			2652	
DATE MAILED: 12/09/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/665,341

Applicant(s)

DENG ET AL.

Examiner

Craig A. Renner

Art Unit

2652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,11 and 13-20 is/are rejected.
- 7) ☒ Claim(s) 2,7-10 and 12 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/18/03 & 6/10/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected to because of the following informalities:
 - a. The drawings fail to comply with 37 CFR 1.84(p)(5) because they include one or more reference signs not mentioned in the description. Note, for instance, "A" (shown in FIG. 12, for instance).
 - b. The figure numbers in the drawings do not match those given in the description. That is, FIGS. 1A, 1B, 2A, 2B, 3A, 3B, 5A, 5B, 7A, and 7B in the drawings are identified as Figs. 1(a), 1(b), 2(a), 2(b), 3(a), 3(b), 5(a), 5(b), 7(a), and 7(b), respectively, throughout the description.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) and/or an amendment to the specification in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the

changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 3 and 13-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. In line 2 in each of claims 3 and 14, "such as" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention or not.

b. In line 1 in each of claims 13 and 14, it is indefinite as to whether "the plurality of step-faces" refers to those set forth in line 2 of independent claim 1, or those set forth in line 2 of base claim 12.

c. In line 3 of claim 13, it is indefinite as to whether "the step-face" refers to that set forth in line 3 of base claim 2, that set forth in line 4 of base claim 2, or that set forth in line 2 of claim 13.

d. In line 3 of claim 14, it is indefinite as to whether "the step-face" refers to that set forth in line 3 of base claim 2, that set forth in line 4 of base claim 2, or that set forth in line 2 of claim 14.

e. In line 2 of claim 16, it is indefinite as to which of the "plurality of step-faces" of the "second air bearing," set forth in lines 1-2 of base claim 2, is being referenced by "the step-face of said second air bearing."

f. Claim 15 inherits the indefiniteness associated with base claim 13 and stands rejected as well.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2652

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1, 4, 5, 11, and 17-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Tani et al. (US 2003/0090833).

With respect to claims 1, 4, 5, and 11, Tani teaches a flying head slider (FIG. 5, for instance) comprising a first air bearing (includes 16, for instance) having a plurality of step-faces (as shown in FIG. 5, for instance) and being disposed on a base surface (15) at air inflow side (140); and a second air bearing (includes 13 and 14, for instance) being disposed on the base surface at air outflow side (as shown in FIG. 5, for instance), wherein an upper most surface of the second air bearing is lower than an upper most surface of the first air bearing (as shown in FIG. 5, for instance) [as per claim 1]; wherein a side rail (12, for instance) is formed in the first air bearing (as shown in FIG. 5, for instance) such that the side rail extends from both ends of a shorter side of the flying head slider toward the air outflow side (as shown in FIG. 5, for instance) [as per claim 4]; wherein a negative pressure generating section (between each 11, for instance) is disposed between the first air bearing and the second air bearing (as shown in FIG. 5, for instance), and a center point of generating the negative pressure is located nearer to the air inflow side from a center of gravity of the head slider (as shown in FIG. 5, for instance) [as per claim 5]; and wherein the second air bearing includes a plurality of step-faces (13 and 14) [as per claim 11].

Art Unit: 2652

With respect to claims 17-18, Tani teaches a head supporting device comprising a flying head slider (51/FIG. 5, for instance) comprising a first air bearing (includes 16, for instance) having a plurality of step-faces (as shown in FIG. 5, for instance) and being disposed on a base surface (15) at air inflow side (140) and a second air bearing (includes 13 and 14, for instance) having a head (lines 16-18 in paragraph [0097], for instance) and being disposed on the base surface at air outflow side (as shown in FIG. 5, for instance); and a suspension (54, for instance) for applying a given energizing force to the flying head slider from a side opposite to a side on which the first air bearing and the second air bearing are disposed on the base surface (as shown in FIG. 10, for instance), wherein an upper most surface (14) of the second air bearing is lower than an upper most surface of the first air bearing (as shown in FIG. 5, for instance) [as per claim 17]; wherein the suspension includes a pivot (52, for instance) that applies the given energizing force to the flying head slider (as shown in FIG. 10, for instance) [as per claim 18].

With respect to claims 19-20, Tani teaches a disc driving device comprising a flying head slider (81/51/FIG. 5, for instance) comprising a first air bearing (includes 16, for instance) having a plurality of step-faces (as shown in FIG. 5, for instance) and being disposed on a base surface (15) at air inflow side (140) and a second air bearing (includes 13 and 14, for instance) having a head (lines 16-18 in paragraph [0097], for instance) and being disposed on the base surface at air outflow side (as shown in FIG. 5, for instance); a suspension (82/54, for instance) for applying a given energizing force to the flying head slider from a side opposite to a side on which the first air bearing and

Art Unit: 2652

the second air bearing are disposed on the base surface (as shown in FIG. 10, for instance); a disc-shaped recording medium (83); driving means (includes 84, for instance, in at least an equivalent structural sense) for driving the disc-shaped recording medium; swinging means (includes 85, for instance, in at least an equivalent structural sense) for swinging the suspension along a radius direction of the recording medium; and control means (includes 86, for instance, in at least an equivalent structural sense) for controlling the drive by the driving means and the swing by the swinging means, wherein an upper most surface (14) of the second air bearing is lower than an upper most surface of the first air bearing (as shown in FIG. 5, for instance) [as per claim 19]; wherein the suspension includes a pivot (52, for instance) that applies the given energizing force to the flying head slider (as shown in FIG. 10, for instance), and wherein a pivot place (22) is defined as a place where the pivot of the suspension contacts the flying head slider and when a center of gravity of the head slider and the pivot place are projected onto a face of the disc, the two projected places coincide with each other (as shown in FIGS. 5 and 11, for instance) [as per claim 20].

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2652

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tani et al. (US 2003/0090833).

Tani teaches the slider as detailed in paragraph 8, supra. Tani, however, remains silent as to "wherein a height difference LA between the upper most surface of the first air bearing and the base surface falls within $3.2 \times 10^{-4} L \leq LA \leq 3.6 \times 10^{-4} L$, where L is a length of a longer side of the flying head slider."

Official notice is taken of the fact that it is notoriously old and well known in the slider art to modify the parameters of slider components during the course of routine optimization/experimentation. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have had a height difference LA between the upper most surface of the first air bearing and the base surface fall within $3.2 \times 10^{-4} L \leq LA \leq 3.6 \times 10^{-4} L$, where L is a length of a longer side of the flying head slider, in Tani. The rationale is as follows:

One of ordinary skill in the art would have been motivated to have had a height difference LA between the upper most surface of the first air bearing and the base surface fall within $3.2 \times 10^{-4} L \leq LA \leq 3.6 \times 10^{-4} L$, where L is a length of a longer side of the flying head slider, in Tani since such a range, absent any criticality (i.e., unobvious

Art Unit: 2652

and/or unexpected result(s)), is generally achievable through routine optimization/ experimentation, and since discovering the optimum or workable ranges, where the general conditions of a claim are disclosed in the prior art, involves only routine skill in the art, *In re Aller*, 105 USPQ 233 (CCPA 1955). Moreover, in the absence of any criticality (i.e., unobvious and/or unexpected result(s)), the parameter set forth above would have been obvious to a person having ordinary skill in the art at the time the invention was made, *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Pertinent Prior Art

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. This includes Krantz et al. (US 5,345,353), which teaches a flying head slider (510) comprising a first air bearing having a plurality of step-faces (511 and 512) and being disposed on a base surface at air inflow side (as shown in FIG. 11, for instance); and a second air bearing (516) being disposed on the base surface at air outflow side (as shown in FIG. 11, for instance), wherein an upper most surface of the second air bearing is lower than an upper most surface of the first air bearing (as shown in FIG. 11, for instance); Hendriks et al. (US 5,424,888), which teaches a flying head slider (FIGS. 13-14, for instance) comprising a first air bearing having a plurality of step-faces (94 and 96) and being disposed on a base surface at air inflow side (as shown in FIG. 13, for instance); and a second air bearing (90) being disposed on the base surface at air outflow side (as shown in FIGS. 13-14, for instance), wherein an

Art Unit: 2652

upper most surface of the second air bearing is lower than an upper most surface of the first air bearing (as shown in FIG. 14, for instance); and Tsuchiyama et al. (US 2004/0150914), which teaches a flying head slider (1) comprising a first air bearing (11) having a plurality of step-faces (112 and 114) and being disposed on a base surface (116) at air inflow side (as shown in FIG. 3, for instance); and a second air bearing (12) being disposed on the base surface at air outflow side (as shown in FIG. 4, for instance), wherein an upper most surface of the second air bearing is lower than an upper most surface of the first air bearing (as shown in FIGS. 2A and 2B, for instance).

Allowable Subject Matter

13. Claims 2, 7-10 and 12 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 3 and 13-16 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.


Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig A. Rehner whose telephone number is (571) 272-7580. The examiner can normally be reached on Tuesday-Friday 9:00 AM - 7:30 PM.

Art Unit: 2652

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, A. L. Wellington can be reached on (571) 272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Craig A. Renner
Primary Examiner
Art Unit 2652

CAR